

## BRIEF ARTICLE

## Delayed Subaponeurotic Fluid Collection of Infancy

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## ABSTRACT

Delayed subaponeurotic fluid collection (DSFC) is a rare but benign lesion in infants that typically presents as an acquired mobile mass on the scalp at 1-3 months and resolves in 2-4 months. The cause of this fluid collection has been determined to be cerebrospinal fluid but the mechanism is unknown. Infants with this acquired mass should be evaluated for trauma (accidental and non-accidental) as well as bleeding disorders, but most cases will be benign and resolve with conservative management.

## CASE

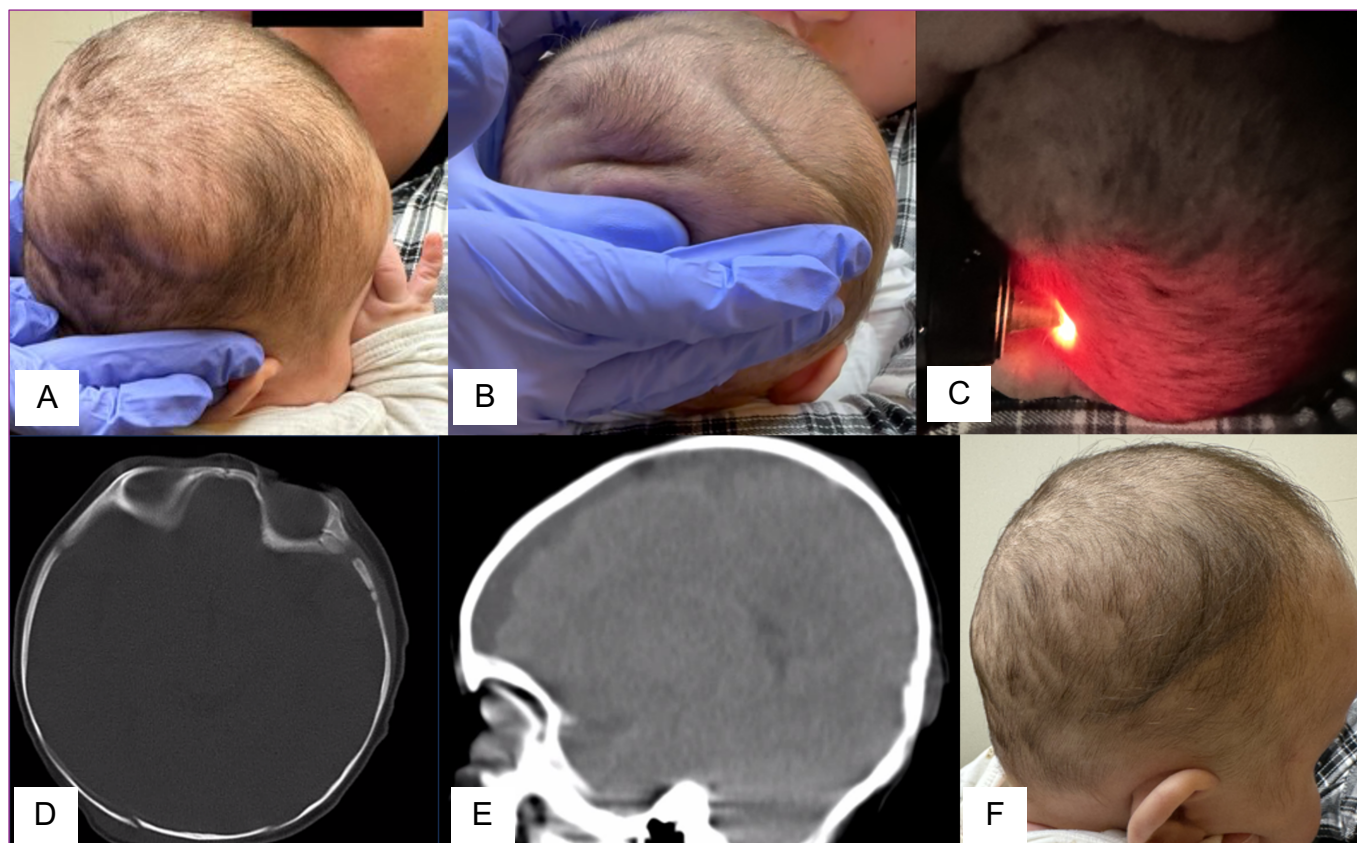
A 2-month-old ex-39 week infant presented with sudden onset of a scalp bump that slowly enlarged over 10 days. Mother stated that there was no recent fall or trauma. There were no neurological, behavioral, or ophthalmological abnormalities. There was no consanguinity or history of bleeding disorder. Birth history included Cesarean section for failure to progress (occiput posterior presentation) and non-reassuring fetal heart tones. He had a nuchal cord and was floppy, requiring face mask ventilation. His nursery course included antibiotics for 2 days but was otherwise unremarkable with no caput succedaneum or cephalohematoma.

On physical examination, the right occipital scalp had a 8 cm x 6 cm soft, fluctuant, non-tender mass that felt like a bag of water (**Figure 1A**). Gentle pressure elicited a fluid wave and spread superiorly and left of

midline, which could be reproduced by changing head position with fluid collecting in dependent areas (**Figure 1B, Supplemental video**). Transillumination demonstrated light passing through the entire mass (**Figure 1C**). Anterior fontanelle was open and flat. There was no overlying skin change, and full body skin examination was normal. CT head performed one week prior showed subcutaneous soft tissue swelling external to the calvarium, and no fracture or hematoma (**Figures 1D, 1E**). The baby was diagnosed with delayed subaponeurotic fluid collection of infancy. Ultrasound was ordered but mom did not get the test because the bump had entirely resolved by 3 weeks later. Six weeks after initial presentation (4 months of age), physical examination confirmed the fluid collection resolved (**Figure 1F**).

Delayed/spontaneous subaponeurotic fluid collection (DSFC) of cerebrospinal fluid<sup>1</sup> occurs in the potential space between the epicranial aponeurosis and periosteum<sup>2</sup>. The subaponeurotic fluid collection may extend to

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**Figure 1.** (A) Right occipital scalp with a 8 cm x 6 cm soft, fluctuant, non-tender mass that felt like a bag of water. (B, Supplemental video) The application of gentle pressure elicited a fluid wave and spread superiorly and left of midline, which could be reproduced by changing head position with fluid collecting in dependent areas. (C) Transillumination demonstrated light passing through the entire mass. (D,E) CT head showed subcutaneous soft tissue swelling external to the calvarium, with no fracture or hematoma. (F) Resolution of fluid collection six weeks after initial presentation (4 months of age).

the superior orbit and to the nape of the neck.<sup>2</sup> DSFC typically presents at 1-4 months (range 3.5 weeks-11 months)<sup>2,3</sup> and resolves within 2-4 months (range 2 weeks-6 months).<sup>3</sup> It occurs in term babies, often with a history of prolonged labor before cesarean section, vacuum/forceps-assisted delivery, or fetal scalp electrode.<sup>2,4</sup> Other lesions in the differential are ruled out because they all present at birth: caput succedaneum (sub-aponeurotic edema crossing suture lines), cephalohematoma (does not cross suture lines). Subgaleal hematoma (due to trauma or bleeding disorder) should be considered, and imaging is recommended (CT/MRI or

ultrasound).<sup>2,4</sup> If there are concerns from history, examination, or imaging then non-accidental trauma workup should be pursued.

Management is conservative<sup>2-4</sup>; in one reported case the lesion recurred twice after aspiration.<sup>3</sup> A literature review showed case reports and small series in pediatric, neurosurgery, and emergency medicine literature but no reports of this condition in dermatology journals. It is important for dermatologists who treat children to be aware of DSFC as these are benign lesions that do not need intervention. A survey from an

internet forum suggests this lesion is under-recognized and under-reported, and parents encounter difficulties obtaining a diagnosis and report distress from evaluation for child abuse<sup>5</sup>. Families should be counseled on the benign nature of the lesion that rarely recurs and has no known long-term sequelae.

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